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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,852	04/20/2001	Richard J. Allen	GB 000051	1431

24737	7590	06/21/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER
MCCARTNEY, LINZY T

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

<table>
<tr><td rowspan="2"></td><td colspan="2">Application No.</td><td>Applicant(s)</td></tr>
<tr><td colspan="2">09/838,852</td><td>ALLEN, RICHARD J.</td></tr>
<tr><td><i>Office Action Summary</i></td><td>Examiner</td><td colspan="2">Art Unit</td></tr>
<tr><td></td><td>Linzy McCartney</td><td colspan="2">2671</td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 May 2004</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-8</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-8</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent No. 6,630,931 to Trika et al. (Trika) in view of the admitted prior art further in view of

Bekaert et al., "Viewing in 3D" (Bekaert).

a.   Referring to claim 1, Trika discloses generating a model of the scene using a

homogenous coordinate system which uses a first, second, and third orthogonal axes and

a homogeneity value (w) (column 5, lines 1-15) and obtaining one or more further

display images from one or more further viewpoints aligned along the first axis with the

first viewpoint and displaced from the first viewpoint by a multiple of a displacement

value (dx), by updating the first axis value of the first display image by an amount equal

k* dx/w, where k is a constant for each one of the further more displayed images (column

5, line 39 – column 6, line 5). Trika does not explicitly disclose obtaining a first display

image from a first viewpoint by transforming vertex positions from the 3D scene into

vertex positions in a frustum viewing region using a projection matrix, the projection

matrix having terms derived from the position of the viewpoint relative to the frustum

viewing region. Applicant discloses that it is known to generate an image of a 3D scene

from a known viewpoint by carrying out transformation on vertex positions from the 3D

scene into vertex positions in a frustum viewing region, using a projection matrix.

Bekaert discloses the projection matrix having terms derived from the position of the

viewpoint relative to the frustum viewing region (page 18, paragraph 1, Fig. 6). At the

time invention was made, it would have been obvious to a person of ordinary skill in the

art to modify the teachings of Trika by transforming vertex positions from the 3D scene

into vertex positions in a frustum viewing region using a projection matrix as taught by

the admitted prior art, and Bekaert. The suggestion/motivation for doing so would have

been to improve image realism of the displayed image (Applicant, page 2, paragraph 2)

and to convert the 3D world coordinates of the vertices to 2D screen coordinates to

determine which screen pixel should represent each vertex (Bekaert, page 2, paragraph

2).

b.   Referring to claim 2, Trika discloses applying lighting conditions when creating

the first image (column 6, lines 10-12). Trika does not explicitly disclose wherein texture

is applied when creating the first image. At the time the invention was made it would

have been obvious to one of ordinary skill in the art to modify the method of Trika to

apply texture to the image, Official Notice taken. The suggestion/motivation for doing so

would have been because it would allow finer and more intricate detail to be displayed

without the cost of rendering more polygons or geometric primitives.

c.   Referring to claim 5, Trika discloses wherein one or more further images are

obtained by a graphics processing device without further use of the 3D scene data

(column 5, line 59 – column 6, line 5).

d.   Referring to claim 6, Trika discloses a memory device storing a model of the

scene using a homogenous coordinate system which uses a first, second, and third

orthogonal axes and a homogeneity value (w) (column 5, lines 1-15; Fig. 1) and wherein

a graphics processor further comprises means for generating one or more further images

from one or more further viewpoints aligned along the first axis with the first viewpoint

and displaced from the first viewpoint by a multiple of a displacement value (dx), by

updating the first axis value of the first image in the viewing region by an amount equal

k* dx/w, where k is a constant for each one of the further more displayed images (column

5, line 39 – column 6, line 5; Fig. 1). Trika does not explicitly disclose a graphics

processor for transforming vertex positions from the 3D scene into vertex positions in a

frustum viewing region to define a first image in the viewing region, the graphics

processor deriving a projection matrix in dependence on the position of the viewpoint

relative to the frustum viewing region, the projection matrix being used to translate image

coordinates form the 3D scene into the viewing region. Applicant discloses that it known

for a graphics card to generate an image of a 3D scene from a known viewpoint by

carrying out transformation on vertex positions from the 3D scene into vertex positions in

a frustum viewing region, using a projection matrix (Applicant, page 2, paragraphs 1 and

2). Bekaert discloses deriving a projection matrix in dependence on the position of the

viewpoint relative to the frustum viewing region (page 18, paragraph 1, Fig. 6). At the

time invention was made, it would have been obvious to a person of ordinary skill in the

art to modify the apparatus of Trika by transforming vertex positions from the 3D scene

into vertex positions in a frustum viewing region using a projection matrix as taught by

the admitted prior art, and Bekaert. The suggestion/motivation for doing so would have

been to improve image realism of the displayed image (Applicant, page 2, paragraph 2)

and to convert the 3D world coordinates of the vertices to 2D screen coordinates to

determine which screen pixel should represent each vertex (Bekaert, page 2, paragraph

2).

3.   Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Trika in view of

the admitted prior art further in view of Bekaert as applied to claim 2 above further in view of

U.S. Patent No. 5,856,829 to Gray III et al. (Gray).

        a.   Referring to claim 3, Trika does not explicitly disclose wherein the homogeneity

        value is inversely proportional to a depth value measured along the third orthogonal axis,

        and is used for interpolation of texture values. Gray discloses wherein the homogeneity

        value is inversely proportional to a depth value measured along the third orthogonal axis,

        and is used for interpolation of texture values (column 8, 38-43; Abstract). At the time

        the invention was made, it would have been obvious to a person of ordinary skill in the

        art to further modify the teachings of Trika to make the homogeneity value inversely

        proportional to a depth value measured along the third orthogonal axis, and use the

        homogeneity value for interpolation of texture values as taught by Gray. The

        suggestion/motivation for doing so would have been to avoid the additional cost and

        complexity required in computing both a z value and the 1/w value (Gray, column 5, line

        56 – column 6, line 2).

4.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Trika in view of

the admitted prior art further in view of Bekaert as applied to claim 1 above further in view of

U.S. Patent No. 5,808,792 to Woodgate et al. (Woodgate) still further in view of Halle,

"Autostereoscopic Displays and Computer Graphics" (Halle).

      a.   Referring to claim 4, the modified method of Trika does not explicitly disclose

wherein the first image and the one or more further images are combined to form an

interleaved image for supply to an autostereoscopic display device. Woodgate discloses

wherein the first image and the one or more further images are combined to form an

interleaved image for supply to an autostereoscopic display device (column 1, lines 10-

16). At the time the invention was made, it would have been obvious to one of ordinary

skill in the art to further modify the method of Trika by supplying the formed images to

an autostereoscopic display device as taught by Woodgate. The suggestion/motivation for

doing so would have been to present an image without the use of glasses or other viewing

aids and because autostereoscopic displays offer the best approximation to the optical

characteristics of a real object (Halle, page 58, column 3, paragraph 1).

5.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Trika in view of

the admitted prior art further in view of Bekaert as applied to claim 6 further in view of U.S.

Patent No. 6,014,144 to Nelson et al. (Nelson).

      a.   Referring to claim 7, the modified apparatus of Trika does not explicitly disclose

wherein the graphics processor comprises a graphics acceleration board. Nelson discloses

the aforementioned limitation (Fig. 2). At the time invention was made, it would have

been obvious to a person of ordinary skill in the art to further modify the apparatus of

Trika by incorporating a graphics acceleration board as taught by Nelson. The

suggestion/motivation for doing so would have been to off-load the rendering functions

from the host processor thus improving system performance (Nelson, column 1, lines 13-17).

6.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Trika in view of the admitted prior art further in view of Bekaert as applied to claim 6 above further in view of Woodgate still further in view of Halle.

   a.   Referring to claim 8, Trika does not explicitly disclose generating multiple images used to drive the display panel as an autostereoscopic display. Woodgate discloses the aforementioned limitation (column 1, lines 10-16). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to further modify the method of Trika by supplying the formed images to an autostereoscopic display device as taught by Woodgate. The suggestion/motivation for doing so would have been to present an image without the use of glasses or other viewing aids and because autostereoscopic displays offer the best approximation to the optical characteristics of a real object (Halle, page 58, column 3, paragraph 1).

Response to Arguments

7.   Applicant's arguments filed 5/6/04 have been fully considered but they are not persuasive. Applicant argues that Trika fails to disclose offsetting an axis of a first image by an amount equal to $k*dx/w$, where k is constant. Trika clearly disclose offsetting an axis of a first image by an amount equal to $k* dx/w$ (column 5, line 15 – column 6, line 5). In particular note the homogeneity value (w) disclosed in equation 5 is multiplied by a displacement value (K_1 + K_2) in equation 10 (Note that Z_v contains Z_w which in turn contains w; see equations 5, 9, and 10) to produce the updated image value (X_v^R). Regarding k being a constant value, note that k (K_1 +

K_2) is calculated using constant values (window coordinates, viewpoint coordinates, focal length,

and interocular distance; column 5, lines 17-52) hence k is a constant.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**.

The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

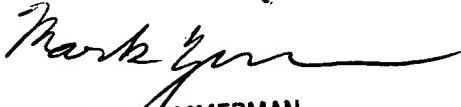Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,

Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the Technology Center 2600 Customer Service Office whose

telephone number is (703) 306-0377.

ltm
6/2/2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600